



## **The Linxian trials: mortality rates by vitamin-mineral intervention group**

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**Abstract:** Two randomized nutrition intervention trials were conducted in Linxian, an area of north central China with some of the world's highest rates of esophageal and stomach cancer and a population with a chronically low intake of several nutrients. One trial used a factorial design that allowed us to assess the effects in nearly 30,000 participants of daily supplementation with four nutrient combinations: retinol and zinc; riboflavin and niacin; vitamin C and molybdenum; and beta-carotene, alpha-tocopherol, and selenium. The second trial provided daily multiple vitamin-mineral supplementation or placebo in 3318 persons with esophageal dysplasia, a precursor to esophageal cancer. After supplements were given for 5.25 y in the general population trial, small but significant reductions in total [relative risk (RR) = 0.91] and cancer (RR = 0.87) mortality were observed in subjects receiving beta-carotene, alpha-tocopherol, and selenium but not the other nutrients. The reductions were greater in women than men, and in those under compared with over the age of 55; however, differences by sex or age were not significant. After multiple vitamin and mineral supplements were given for 6 y in the smaller dysplasia trial, reductions in total (RR = 0.93) and cancer (RR = 0.96) mortality were observed but these were not significant. The largest reductions were for cerebrovascular disease mortality, but the effects differed by sex: a significant reduction was observed in men (RR = 0.45) but not women (RR = 0.90). Restoring adequate intake of certain nutrients may help to lower the risk of cancer and other diseases in this high-risk population.